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# Resources, scenarios, agency: environmental computer games

## Abstract

In this paper I argue that computer games have the potential to offer spaces for ecological reflection, critique, and engagement. However, in many computer games, elements of the games' procedural rhetoric limit this potential.

In his account of American foundation narratives, environmental historian David Nye notes that the 'second-creation' narratives that he identifies "retain widespread attention [...] children play computer games such as *Sim City*, which invite them to create new communities from scratch in an empty virtual landscape...a malleable, empty space implicitly organized by a grid" (Nye, 2003). I begin by showing how grid-based resource management games encode a set of narratives in which nature is the location of resources to be extracted and used.

I then examine the climate change game *Fate of the World* (2011), drawing it into comparison with game-like online policy tools such as the UK Department for Energy and Climate Change's *2050 Calculator*, and models such as the environmental scenario generation tool *Foreseer*. I argue that while both may be narrowly successful in generating engagement with climate change and resource issues, in other ways their effect may be disempowering: firstly, they emphasise the scale and complexity of environmental problems; secondly, they prioritise technocratic top-down policy responses at the expense of changes on the level of individual behaviour.

This paper then turns to examples of digital games and playing strategies that offer more plural and open-ended engagement with environmental concerns. The on/off-line game *World Without Oil* (2007) encouraged players to respond to a fictional oil crisis, generating sustained and solution-focussed engagement. Examples of 'expansive play' also reveal ecocritical playing strategies in the sandbox-game *Minecraft*, a game which may initially seem to take the logic of resource extraction to its extreme. Finally, I look at David O'Reilly's off-beat game-animation *Mountain* (2014), which in its unflinching mountain removes the agency of the player, and mocks the 'nature as resource' model of the games previously discussed. Instead *Mountain* invites an ontological reconsideration of the player's relationship with the non-human.

Keywords: computer games, ecocriticism, climate change, scenarios, policy simulators

## Introduction

In his account of American foundation narratives *America as Second Creation* (2004), environmental historian David Nye examines popular accounts of technological progress in America from the eighteenth-century onwards, and shows how the understanding of each new technology—the axe, the mill, the canal, the steamboat, the railway, and irrigation—leads to what he calls a foundation narrative of "second-creation" (40). Nye identifies four structuring shifts in perception that are important to this narrative: firstly, the "imposition of a grid on an empty landscape" dividing the land

not by type or according to natural features, but with an arbitrary grid; secondly, the “expansive belief in resource abundance” and the rejection of Old World (particularly British) notions of scarcity; thirdly, the “rejection of government regulation in favour of the free market”; and finally “a world in which access to force [energy] and efficiency in using it improved constantly” (287).

The result of these shifts, Nye shows, is that the continent of North America is seen by colonists as a paradisaical natural environment of remarkable abundance, but one which is to be *improved* by technological progress, creating a kind of augmented Eden, a ‘second creation’. After all, “How could anything but progress result from using natural forces to develop the immense resources of an empty continent in a free-market economy?” (Nye 287). In his conclusion, Nye observes that although the underlying concepts were undermined during the twentieth-century, the technological creation story itself, “has by no means disappeared”: “Children play computer games, such as *SimCity*, that invite them to create new communities from scratch in an empty virtual landscape where a grid defines the contours of roads and the arrangement of houses, factories, and commercial districts” (288).

The continuing presence of the grid is particularly apparent in these games which invite players to create a civilization (the *Civilization* series), or a city (*SimCity* series) or a colony (*Colonization*), in virgin territory. The name often given to this genre is ‘God games’, with the player supposedly given omnipotent control over the game environment, revealing the enduring presence of the second-creation narrative. The video trailer for *SimCity 4*, for example, shows a young man walking up to the edge of a canyon edge, and with sweeping deistic gestures clearing away the mists, raising a landmass, planting vegetation and then summoning a city, accompanied by suitably grand music (“*SimCity*™ 4 Deluxe Edition”).

There something familiarly dismissive in the way that Nye characterises the computer game genre as for children, mentioning them only once and in passing: “Nor are such visions limited to children’s games” (288). In this essay I argue that his observation has implications for assessing the ecological limitations of some computer games. I argue that hallmarks of the foundation narrative that Nye identifies persists in a number of computer games—the presence of the grid, the implication that ‘nature’ is primarily a resource to be used, the idea that through technological progress we can improve on nature, and a teleology of technological progress. Nye shows how the success of the foundation narrative based on these ideas effectively suppressed other narratives, including those of indigenous American people, and narratives of ecological limits. Counter-narratives had to try and “subvert at least one of the four underlying concepts”, and were therefore mostly rejected as “un-natural”: “were land, power, and resources really abundant, or were there natural limits?” (Nye 41). The consequence, is that “ecological or human losses were largely excluded” from the narrative (Nye 40).

Gaming has the potential, as various critics have argued, to make ecological ideas meaningful to players; that, in John Parham’s terms “the virtual can [...] put us in touch with the ecological” (Parham). In their characteristics of interaction, immersion and engagement, computer games may represent ideal media for ‘green’ or environmental

thinking, since the player is consistently expected to manipulate their environment. Toward the end of this essay I look at some examples of how the ecological can emerge in computer games in perhaps surprising places. However, manipulation of the environment can also be deleterious, and the continuing presence of some of these underlying assumptions that Nye identifies, and the persistence of the foundation narrative in many computer games, places limits on the capacity of such games to engage in nuanced ways with environmental issues, such as climate change or biodiversity loss.

I begin by showing how in both their narrative and in their aesthetic, games like *SimCity 4*, *Civilization* and *Minecraft* perpetuate some ecologically unhelpful assumptions. I move on to discuss the game *Fate of the World*, set in a future of accelerating climate-change, and—drawing comparisons with online policy—show how, although it draws attention to pressing environmental problems, it may disempower the player both by emphasising the scale of the task, and by prioritising technocratic responses to climate change. Finally, I turn to the online alternate-reality game *World Without Oil*, and to the game *Mountain* to show how some of these assumptions and teleologies can be challenged through innovative games.

## **‘God games’ and resources**

The underlying assumptions of Nye’s second-creation narrative will feel familiar to players of two highly successful series of computer games: Will Wright’s *SimCity* series (1989-2013), developed by Maxis studio and released by EA games; and Sid Meier’s *Civilization* series (1991-2016). Both series of games have been highly influential, spawning numerous spin-offs and clones, and remaining popular over many sequels. In essence, the games in both series begin with the representation of a natural environment, with gameplay involving building, respectively, a modern city, or a civilization built around a number of cities.

As Nye describes, in *SimCity* games a grid defines the arrangement of residential districts, roads and commercial districts from the outset; in *Civilization* games, a grid likewise controls activity within each square, the movement of the player’s units, and organises the resources available to the player. Similarly, in accordance with Nye’s foundation narrative, games in both series start with an empty, malleable landscape with abundant resources: the *SimCity 4* tutorial begins by telling the new player “you’ve got a bunch of cash and some pristine land. Try to make a thriving metropolis.” Any idea that a player might want to leave the environment—this pristine land—as it is, undeveloped, runs counter to the game’s entire narrative.<sup>1</sup>

Of course it can be argued that the organising structure of the grid derives at least in part from hardware and software limitations on the early games in these two series. As Bianchi notes, following Terry Harpold, “digital games’ cultural signifiers [...]

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<sup>1</sup> Though not counter to its constraints. For more on this kind of ‘expansive play’ or ‘counter play’, see **A Walkthrough, or just a walk?** section below.

are inherently bound to and governed by material limitations (i.e., processing speed, memory, graphical capabilities, keyboard and mouse controls, etc.) and not just the cultural context of the designers and players”; interestingly, this is, she observes, especially true “for animals and nature as a whole” (Bianchi 210). Presumably because, as games eco-critics have stressed, animals and nature have been routinely cast as mere backdrop to the main anthropocentric narrative, an “equivalent to theater flats” (Chang, “Games as environmental texts” 59). Despite this caveat regarding material limitations, I argue that even as the grid aesthetic became less dominant in later games in these series (the fifth and sixth iterations of *Civilization*, for example, moved to a map of hexagonal tiles), it derives from the ‘cultural context of the designers’ and has been influential in subsequent games.

Game scholars such as Ian Bogost have argued that the rhetoric of a digital game is derived not only from its semiotic elements (e.g. graphics or text) but also from its ‘procedurality’. The grid straddles these two categories: it visibly orders the game environment, but is also part of the set of “rules that create particular possibility spaces for play” (Bogost, “Rhetoric of video games” 122). In the case of both *SimCity* and *Civilization*, the “procedural rhetoric” promotes an idea of the game environment as an empty landscape waiting to be built upon (Bogost, “Persuasive games” 1). The player is not, in the strictest sense, *required* to use natural resources, build cities, and aim for technological ‘progress’; but the game mechanics give the player little choice but to pursue this path. This is amusingly apparent in the *SimCity 4* player tutorial, which makes clear this Hobson’s Choice: “Whether you prefer a farming village or a GIGANTIC METROPOLIS [...]” (emphasis in original). Although *SimCity 4* supposedly offers the player the option to build a low-resource, low-impact city, in reality the game’s mechanics often “constrained environmental understanding within parameters dictated by the Western capitalist value system” (Parham, citing Nilsson and Jakobsson).

Bianchi has shown how in the early games of the spin-off *Sims* series of computer games, to the extent that the player can engage with nature at all it is in terms described by Max Oelschlaeger as ‘resourcist’: “visually and procedurally” players are separated “from the game’s representation of natural environments” (Bianchi 213). Like in the *Sims*, in *SimCity 4* the player can build parks and green spaces, but these are understood as beneficial only in the degree to which they encourage Sims to move into the city: in other words, despite this greater interaction with the game-world environment, the game’s procedural rhetoric still “coincide[s] with conceptions of nature as a resource” (Bianchi 213). Bianchi argues that successive iterations of the *Sims* games manage to move away from a wholly anthropocentric representation of nature, but the “cognitive hegemony” of ‘resourcism’ which pervades the *SimCity* and *Civilization* games remains in place (Oelschlaeger 284).

This limitation can be found even in games with an avowedly didactic and environmental purpose. John Parham identifies similar ecological concerns in an EU-funded pedagogic game *EnerCities* aimed at secondary school pupils “connected to the game’s conformity to both humanist and, implicit in the emphasis on growth, ideological values. Grid squares into which the fictional city is divided imply, for example, an

entirely utilitarian approach to the land” (Parham). In the next section, I examine *Fate of the World*, an environmentalist computer game that attempts to avoid some of these pitfalls.

## Climate models and climate games

As Chang notes, “almost by definition, all computer and console games are environments, but surely not all games are environmental” (“Games as Environmental Texts” 58). In fact, she concludes, few engage in ways that go beyond the simplistic forms addressed in the previous section. Some games, though, have attempted to address major environmental issues head-on. The climate change game for PC *Fate of the World* (2011) gives the player the chance to control global policy in an effort to avert catastrophic climate change. The narrative starts in 2020, with a world environment summit, at which a Global Environment Organisation is formed to take control of environmental policy actions. The player recruits representatives in each of 12 regions, and can then choose from over one hundred policy responses ‘cards’ from a deck, in an effort to meet the aims of particular missions. These missions mostly revolve around reaching a certain date having kept climate change to 2 or 3 degrees above pre-industrial levels, while maintaining the Human Development Index above a set level in every region. News headlines and detailed data on 24 indices (GDP, literacy, emissions, water stress and so on) for each region give the player feedback.

As the designers were keen to stress, the game’s models are based on real-world data, and designed in collaboration with Dr Myles Allen at the University of Oxford. Its ambition to suggest realistic consequences of the player’s choices of global and regional climate- and social-policies brings it into conversation with two sets of antecedents: models of the future climate itself; and game-like tools used for policy development and public engagement with climate and resource policy.

Climate models are not, clearly, computer games: though their development certainly has been in parallel with the history of increasing computing power (Edwards 115, 278 et passim). There are huge epistemological differences between the use of computer-based climate models to create scenarios of the future climate, and computer games that create speculative narratives of future society based on game code that responds to player feedback. But they also share fundamental features of iteration, response to feedback, and future scenario building. In his exhaustive history of climate models, Paul Edwards shows that our understanding of climate—past, present and future—relies fundamentally on models; the idea of meaningful ‘pure’ data separate from models is a myth (Edwards xiv). As he says, “the epistemological undercurrents of this [...] argument [concern] the proper role of models in forecasting climatic change: not as absolute truth claims or predictions, but as heuristically valuable simulations or projections”; we will “always experience them [climate futures] as probabilistic, as shimmering rather than fixed” (Edwards 352). The comparison with computer games is

not intended at all to call into question the validity of these models, but rather to note that looking at climate futures through computer games has a natural precedent.

An even clearer precedent is in models of resource and infrastructure planning, and in particular the system dynamics of MIT Sloan School of Management professor Jay Forrester. Forrester's work in the 1960s and 1970s was a strong influence on Will Wright as he developed the original *SimCity* (Kushner). As Forrester turned these systems to examine global issues (in *World Dynamics*, 1971) he became a critic of growth; it was four of Forrester's students who built upon his work to write the seminal 1972 book *The Limits to Growth* (Meadows).

More recently, computer game-like tools have become common for modelling the effects of policy in resource management. One example is Foreseer, an environmental scenario generation tool developed by a team at the University of Cambridge ("Foreseer"). The Foreseer Project was a BP funded project resulting in a tool for visualising the influence of future demand scenarios on requirements for energy, water and land resources (Allwood). This resource forecasting tool works on user inputs to model future resource shortages, demand for final services, and the value of technological innovation. Although the interfaces and modelling technologies may differ, the basic structure of this tool is not dissimilar to that of *SimCity*, or *Fate of the World*: the user/player makes decisions about competing resources, which has effects on the demand for services and the value of differing technologies and responses, which in turn may affect the decisions about input that the user makes in the next iteration; comparing outputs of successive iterations, the user can make better decisions.<sup>2</sup> In Foreseer the output is represented in a Sankey diagram; and in *Fate of the World* it is represented in shifts in regional statistical data. It is not surprising, then, that one of the researchers on the Foreseer project has described the original Foreseer tool as a 'game-like model of Californian resources', and that its value is as a 'game player exercise about possible futures [...] to see how different decisions have impacts'.<sup>3</sup>

A fascinating example of an attempt to use such a tool for open and transparent policy-making is the UK Government's Department for Energy and Climate Change (DECC) *2050 Calculator* (2010). The *2050 Calculator* is an online interface, based on a "monster spreadsheet", allowing users to change an array of options relating to the supply and consumption of UK energy (Mackay). The *2050 Calculator* is not a computer game, but it conforms to many of the generally agreed criteria: it has clearly defined rules (the assumptions can be altered by users); it gives user-feedback (in emissions reductions, and cost); and it has a desired end goal. This end goal is an energy system balancing supply and demand, with emissions reductions that meet UK legal commitments under the Climate Change Act (2008). It is even mildly competitive, with a number of 'Pathways' designed by stakeholders in the energy system (five government

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<sup>2</sup> It is interesting to note that this policy tool has itself been used in an educative-game context with students (Bajzelj).

<sup>3</sup> Keith Richards, speaking at *Culture and Climate Change: Scenarios*. Scott Polar Research Institute. Cambridge, UK. 15<sup>th</sup> Sept 2016.

examples, and others by environmental groups, the National Grid, Campaign to Protect Rural England and so on), with which you can compare your own.

In the original 'classic' version of the Calculator the interface is graphically fairly unappealing and the feedback is entirely in the form of data represented in graphs, segmented bar charts and complex Sankey diagrams. But data is also at the core of feedback in *Fate of the World* and other games, like *SimEarth* where the desktop can become overrun with "innumerable bar graphs" and "images that would be equally comfortable in an environmental science textbook" (Chang, "Playing Nature" 25). In an updated version of the *Calculator*, the interface becomes more intuitive, and a simple cartoon-like "picture near the top of the screen changes to reflect the choices you've made" (by adding icons for wind turbines, car icons replaced with bicycles and so on), in addition to the graphs and charts. This graphic feedback is improved further in the slightly simplified online tool *My 2050* ("DECC presents: My 2050").

In game reviews of *Fate of the World*, and in review-like articles on the *2050 Calculator*, a striking theme emerges around the complexity and difficulty involved. Reviewers describe the "sheer difficulty of *Fate of the World*", and the "sobering" effect of "watching the planet crumble – wars and natural disasters are often triggered inadvertently by your decisions, and you're informed each time a major species becomes extinct" (Arnott). A RockPaperShotgun (RPS) review calls the game a "very difficult turn-based strategy game indeed. There is a good reason for that. Saving the planet—saving civilization as we know it—is not going to be a cakewalk, after all. So while it teaches me, it also scares me, rather a lot" ("The Games of Christmas '11"). The same review implies a sense of frustration: "And I fail. Again and again and again. I don't think I'm entirely rubbish, it's just that saving the world from ourselves turns out to be quite complicated" (Ibid.). A separate review on RPS calls it "as an educational videogame, a masterpiece" but narrates the extraordinary difficulty and complexity involved in understanding the consequences of your decisions: "You find out you're an idiot. Not because your plan doesn't work, but because there are side effects that never occurred to you" (Smith).

Articles covering the launch of the *2050 Calculator* acknowledge the game-like nature of this online tool, which was designed under the leadership of the late David Mackay, then Chief Scientific Advisor to DECC, who on his own blog describes the tool's "'play Secretary of State for Energy and Climate Change' approach" (Mackay). Mackay's measured observation is that the tool might "help people understand the range of possibilities that are open to us; the trade-offs; the common themes shared by energy pathways that add up; and the scale of action required" (Mackay). But media coverage shows that a common reaction to the tool was the realisation that the problem itself is daunting: "a few minutes of play shows just how difficult it will be to cut emissions 80% on 1990 levels in four decades"; "Doing it yourself gives an unusual and vivid insight into the difficulties faced by real policymakers in grappling with our energy future" (Vaughan; McCarthy).

From the perspective of engagement with ecological issues such as climate change, then, we can perceive two inter-related problems with both the *Fate of the*



*World* policy-game, and DECC's game-like tool. The first is the representation of the complexity and scale of the solutions required. It is difficult not to wonder if this was a desired outcome in both cases: *Fate of the World* challenges you to see if you can solve an almost intractable, a "super wicked", problem, and some players apparently relish the frustration of "solving unexpected problems with *your own plan*" (Levin; Smith). DECC's *Calculator* seems to say: 'look what a fiendish job we have got on our hands'; or as Louise Tickle wrote in *The Guardian*, "Such is the life of an energy planner. I have more sympathy now" (Dudman et al.). But it has become increasingly accepted in recent years that narratives of catastrophe and disaster around climate change in all forms of media are far from productive, and are instead disempowering (O'Neill and Nicholson-Cole); there is a danger that these simulations—at the same time as being educative—convince players first and foremost of the possibly insurmountable scale of the problem.

This may be compounded by a second limitation. As these two examples (and there are others in both genres) draw on their common antecedents, they both naturally prioritise top-down state- or even global-level policy mechanisms as the means of implementing change. Whilst excusable in both cases, this prioritisation has consequences. In *Fate of the World*, the game's engagement with real-world environmental crises—and its clear desire to engage its players with these issues—can seem at odds with the game's aesthetic: with its interface's 'Blue Marble' view of the Earth, there really isn't an 'environment' or 'nature' for the player to engage with. All of the player's interactions with natural processes, or resources or habitats, or with mega fauna (as they become extinct), is mediated through news reports or data ("The primates [Sumatran orangutan] are extinct, the victim of shrinking rainforest habitats and poachers"), or through policy interventions ("Subsidise biochar"). Even environmental attitudes are encoded in a policy card that allows your government to "Raise Eco-awareness", helping to shift a region's population's attitudes.

In the case of the *2050 Calculator* a technocratic bias may seem unsurprising, originating as it does in a government department. Certainly there is a policy emphasis here. But the tool is actually fairly good at stressing the importance of demand side reduction, and at least suggesting that some changes are on the level of the individual—both facts registered by commentators on the tool (Dudman et al.). However, although Mackay asserted that the intention of the tool was "not to imply that the energy system could or should be centrally planned", by its very nature, gathering these supply and demand drivers in one place to be controlled by uniform slides does seem to suggest exactly that (Mackay).

Perhaps rather than 'God games', we should call these 'technocrat-games': Mayor, President, Leader of the Global Environment Organisation—these games give all the power to policy-makers.<sup>4</sup> *Fate of the World* has some real strengths in environmentalist terms: its encyclopedia is detailed and informative; and its gameplay requirement to balance climate adaptation with mitigation foregrounds an important, and (in public discourse) too often overlooked debate. However, in a procedural rhetoric that implies

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<sup>4</sup> And indeed, 'acts of God' such as earthquakes, not in the player's control, are also common in these games.

a possibly insurmountable problem only to be addressed through centralised policy mechanisms, there is a real danger that it is disempowering for the player-as-citizen. In the next section, I turn to innovative games explicitly designed to empower the player-as-citizen, and which emphasise the potential of bottom-up responses to large-scale societal crises such as peak oil and climate change.

## Player-as-citizen

The 2007 online ‘alternate reality’ game *World Without Oil* (*WWO*) represents a fundamentally different approach to engaging with societal challenges through games to those policy-oriented games discussed above. In this online participatory project players were invited to contribute responses, in any media or form, to an evolving (fictional) energy crisis. Players documented real and fictional actions, as well as their attitudes and emotional responses, in videos, photographs and text, mostly hosted on their own blogs or other platforms, but all linked through the *WWO* main website. Played over 32 days, *WWO* simulated the first 32 weeks of a global oil crisis, and participants described a full range of responses. Players reported the consequences of the crisis, and, reacting to news fed to them by the game’s designers, the increasing pressures they were facing: the stress on infrastructure, the difficulties in everyday life, in work and in relationships. As writer and games designer Ken Eklund put it “*WWO* in its design was very open in what the story was going to be”, but the variety and creativity of participants meant that responses ranged from the micro (e.g. a shortage of migraine medication) to the geo-political (Eklund).<sup>5</sup>

A noticeable shift in the nature and mood of stories contributed to the project was apparent across the month over which it ran. Perhaps unsurprisingly, as the fictional scale of the crisis increased, stories about the deleterious effects of an oil crisis likewise ramped up from inconvenience and expense, to, in some cases, reports of rioting and violence. But following a “seminal moment” in which one player said “I’ve had it with hearing about all these problems, we need to start thinking about solutions – how we’re going to move forward”, there was a move toward an emphasis on community, and on solutions (Eklund). A wrap-up Livejournal post at the end of the project describes the overall impression of “People working together, sharing ideas, and experimenting with different ways of going about their everyday lives” (‘A to Z’). Eklund remembers a turn toward “things like grow-your-own food, or other sorts of community resilience” (Eklund).

Chang is right to note that the fact that alternate-reality games like *World Without Oil* involve “direct, physical interaction with the real world overlaid with a game-like scenario” does not grant them any inherent superiority (‘Playing Nature’ 72). But in the case of *WWO* this overlaying of the real with the virtual was helpful in

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<sup>5</sup> This and other quotations hereafter cited as (Eklund) are from an interview conducted with Ken Eklund by the author in February 2017.

creating a community of engaged players thinking seriously about an environmental and social issue: players shared stories that derived in lesser or greater part from their own (real) lives, and shared real-life experience and knowledge in response to other players' (fictional) concerns. This mixing of real and virtual made this game more 'serious' for players, since they were imagining a scenario as it played out in relation to their own lives, and their own futures. What is significant here is the game's experiential nature – players inhabited the scenario, imagining it into their own lives. As Jane McGonigal, who was involved with the game, has written "players were telling stories about the futures they cared about most—the future of their industry, their religion, or their own town and their children." (McGonigal 310). This personal engagement is key, since an often cited barrier to engagement with issues such as climate change, is that they are too big and too far away; in other words, they seem somehow impersonal. As Ken Eklund notes, the game allowed players to take on an empowered role, "taking hold of a different sort of crisis narrative, not the one where crisis is something that happens to you, but is something that happens to you and you recover from it" (Eklund). Another consequence of this was a concentration on local lived experience, as opposed to on the level of national or even regional responses. As Eklund says, the reason for this is that "you don't necessarily feel comfortable talking about what's happening in your state, or even in your city [...] but you feel confident talking about your neighbourhood" (Eklund).

These features—the personal, the everyday, and the local—are key to understanding the success of *WWO*'s engagement with a large-scale environmental issue; they are also in stark contrast to the game mechanics of a game like *Fate of the World*. *WWO* was, according to Eklund, almost an experiment in "participatory governance [...] starting with collaborative imagining of futures" (Eklund). *World Without Oil*'s open-ended invitation to play within the context of an energy crisis resulted in a rich engagement with the topic of environmental sustainability. *World Without Oil* locates agency in the imaginative acts of individuals, empowering them to devise stories of their own personal responses to environmental change, rather than offer the player a toolkit of top-down policy interventions in which individuals are, broadly, invisible.

## **Of Humans and Mountains**

If *World Without Oil* empowers players by giving them agency, then a game like David O'Reilly's *Mountain* might initially appear to remove a player's agency altogether. In *Mountain*, many of the player's expectations of a game are confounded; it is a game that, in part, asks what constitutes a computer game. It begins with the generation of a 3D model of a mountain, floating—as if pulled up by its roots—in a bubble of cloud in space; in terms of interactivity, very little happens. Random koans of cod-philosophical musing appear in text in the sky; most players work out that they can generate these by hitting a certain key. Occasionally, objects—detritus of the modern world, or just

amusing objects?—hurtle from space into the mountain and embed themselves in it. Day turns to night; the weather changes. But there is little that the player can *do*, and interaction with the mountain is absent. One could argue that this is hardly a computer game at all, and yet it was sold as one on Steam and reviewed as one on, for example, RockPaperShotgun (O'Connor).

Here, certainly, the natural environment is not simply a resource. But although it is a game that asks to be thought of philosophically, both the mountain and *Mountain* resist interpretation. The mountain may be thought of as invoking, or perhaps parodying, the tradition of the sublime; but most clearly, the unflinching mountain withdraws from us, unmoved by our interest or disinterest. We may read emotions or patterns into its zen-like statements, but we are aware that these are just our interpretations.

Bianchi observes that “rules and processes mediate player interactions in digital games, and the way players negotiate this mediation creates specific arguments about players and their relations to certain signifiers within the game”; at first glance, such a position would seem problematized by a game whose processes mediate “player interactions” almost out of existence. But actually, it is the way the player negotiates this mediated non-interaction which reveals their relationship with the Mountain. This is not an environment that can be manipulated, but instead is co-existed with. Discussing the game *Spore* Chang laments that it “could be said to recapitulate some of the sorrier assumptions of our current ecological frame of mind, in which humans reign supreme, followed by charismatic megafauna, with the rest of the animal, plant, and inorganic matter of the world forming a picturesque backdrop without recognizable agency”; but in *Mountain* it is arguably the *player* who lacks agency, bringing some ontological parity between player and mountain. The game announces at the beginning that YOU ARE MOUNTAIN. Ian Bogost, games theorist and object-oriented ontologist, argues that this cannot refer to the idea that in the game we take on the existence of the mountain, in the role-playing scenario so common in computer games, because this simply isn't the experience of ‘playing’ *Mountain* (Bogost “You are Mountain”). Rather, it must mean “You are *Mountain*” – the game is us, the game is in our watching the mountain, questioning the mountain and ourselves. *Mountain* invites an ontological reconsideration of the player's relationship with the non-human.

## A walkthrough, or just a walk?

The resource-centric approach to the game-world's environment described above (**'God games' and resources**) reaches, seemingly, its apotheosis in the sandbox-game *Minecraft* (alpha version released in 2009) by independent studio Mojang (acquired by Microsoft in 2014). *Minecraft* has no goals other than surviving attacks from skeletons, spiders and other creatures that appear mostly at night: many players do so building a shelter or house. It is this building process that most players enjoy about the game. In *Minecraft*, the entire environment is composed of uniformly sized

cuboid blocks—sand, wood, stone, coal and so on—all of which can be ‘mined’ by striking them with a fist, a pickaxe, or a spade and turned into items useful to the player (glass, planks, stone tools, torches). This takes the utilitarian approach to land to the extreme, where nothing in the environment is not a resource to be extracted. *Minecraft* makes no attempt in its aesthetic to realistically mimic a natural environment, choosing instead to construct its landscape entirely out of pixelated cubes of different colour and patterns, each representing a different material. In its entirely cuboid landscape, it pushes the organisation of land via an arbitrary grid into three dimensions.

But just as the game *Mountain* resists and subverts expectations about interactivity in computer games, so players even of schematic games such as *Minecraft* can find ways to resist and even critique the procedural rhetoric of the game, and its ecological implications. For example, the procedural dominance of resource extraction in *Minecraft* is the subject of an elegant commentary by new-media artist Kent Sheely, whose *Minecraft*-mod project entitled *Resourcefull* “replaces the textures of resources and constructed materials with the logos of corporations who consume and utilize those materials” (“Resourcefull”). Sheely describes the project as “an environmental statement [...] about conserving natural resources, [...] wanted people to be aware of where the things they use every day actually come from, and that they need to be aware of their personal impact on the planet when making choices about the things they buy and use.”<sup>6</sup> What Sheely’s intervention serves to do is remind us not only of the ecologically problematic extraction of resources from the environment that *Minecraft* in some way replicates, but also the fact that our own consumption of these resources is mediated via global corporations with dubious ethical and ecological records. Each block type is linked to one company and Sheely “tried to choose logos of corporations who use that particular resource for their products”; the most common blocks in *Minecract* (dirt and stone) are linked to major petroleum companies, “so you end up seeing a lot more of the oil company logos as you walk around.”



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<sup>6</sup> This quotation, and those following, are from personal correspondence with Kent Sheely.

Image by: Kent Sheely. Reproduced by permission of the artist.

Unlike the early *Sims* games discussed above, no one could accuse *Minecraft* of restricting interactivity with the player's game-world environment; indeed, there is little else to do. But from an ecocritical perspective *Minecraft* is somewhat paradoxical. On the one hand, both its aesthetic and in its procedural rhetoric can be said to fall foul of one of the "missteps in the realization of in-game environments" that Chang identifies: "predicating player success on extraction and use of natural resources" ('Games as Environmental Texts' 58). Similarly, although resources are not infinite, most are extraordinarily abundant, and there is no pollution or other negative consequence of 'over-extraction'. However, as a sandbox game, with no clearly defined goals, the game also allows for more environmentally engaged approaches, even if it does not require them. Rust et al. suggest, "environmental ethics are thus not part of the design [of *Minecraft*] but are instead player motivated and severely limited in the game world" (200). Limited, true; but present nonetheless. Other engagements with the *Minecraft* game-world environment are certainly possible. Players have, for example, set vegetarian and vegan challenges in *Minecraft*, encouraging players to play without killing animals for food ("Minecraft: Pixel's Vegetarian Challenge").

But it is the game-landscape of *Minecraft* that provokes the clearest environmental responses in players. As a procedurally generated world, any *Minecraft* world is practically infinite. However, one player set out in 2011 to walk to the edge of the world, called the 'Far Lands' by the game's designer Marcus Persson. Youtube user kurtjmac starting walking West and recorded his progress in regular videos, with voiceover commentary. Beginning with just 20 subscribers in 2011, *Far Lands or Bust* (FLoB) has 375,000 subscribers in early 2017; and kurtjmac is still walking. There are now over 600 episodes between 15 and 90 minutes long. Early episodes follow a standard pedagogic form of teaching new players the basics of the game, but as the expedition to the Far Lands quickly comes to dominate the series, kurtjmac discusses features of the landscape ('that's weird structure, a huge spire'), and begins to also talk about himself ('a little confession', 'a personal aside'). Consequently the series gradually shifts genre, to resemble a travel documentary, and conforms more to the tradition of Thoreau ("you must walk like a camel, which is said to be the only beast which ruminates when walking") than a 'Let's Play' Youtube video (Thoreau 228). Just like many other long-distance walkers, kurtjmac now does so for charity, and has raised \$335,000 for the Child's Play charity ('Minecraft Far Lands or Bust'). To put it another way, what starts out as a walk-through, becomes a walk.

Clues to a Thoreauvian attitude towards the game-environment are already apparent in the first episode, in which kurtjmac explains that he prefers single-player games, because multi-player servers tend to already be built up with cities, and "I kinda like starting in a fresh wilderness, and just trying to survive on my own" (FLoB episode 1). The log-cabin which he builds in the first few episodes, and the frontier spirit of heading West, place this firmly into Nye's American foundation narrative; but the engagement with *Minecraft*'s natural environment goes far beyond resource extraction

in FLoB. As kurtjmac remarked in a profile in the *New Yorker*, the game continually “re-grabs my attention with a perilous cliff, a zombie attack, or a memorable landscape, and I remember the journey I’m on” (Parkin).

The landscape, and the non-human actors within it, become crucial elements in this narrative. Early in the narrative, kurtjmac tames a wolf, who becomes a constant companion, and key character, getting lost and found along the way. In a prescient comment as early as Episode 15, kurtjmac discusses a memory of playing *TombRaider*: ‘a wolf jumped out [...] and I remember [...] this is the moment when I realised that video games were, like, pretty legitimate [...] I screamed, and dropped the controller [...] it was the first time a video game had gotten that kind of reaction out of me’ (‘FLoB’).

A similar earlier project, *Towards Dawn* (2010-2012) records another nomadic life in *Minecraft*, this time heading East. Recorded on a blog, *Towards Dawn*, even more explicitly than FLoB, takes the form of a travel narrative. Written in the first person, and in the present tense, the narrative makes no reference to the virtual nature of its environment, and is illustrated with images (screenshots) which are referred to as ‘photos’ or ‘pictures’. The narrative is subtitled “Leaving the miner’s life behind”, and the narrative contains repeated references both to a previous mining life and to the difficulty in leaving it: “I won’t go too deep, I promise myself, but I need some resources”; “I’m tempted to push deeper. [...] No. I have to leave it”; “Perhaps I was finally learning to let go of the underground. I didn’t need diamond or gold, not where I was going.” The narrative is dominated by description of the landscape—“the beauty of this mountain”; “the majestic mountain”; “The canyon was just as breathtaking as the previous dusk”—and the narrator’s appreciation of the environment: “gazing at the stars”; “I found observing them [some pigs] enjoyable for a time. I couldn’t say why. They just seemed very relaxed and content under their tree.”; “I sat and just took in the view for a while”.

There is an unmistakable ecocritical attitude displayed in *Towards Dawn*, in its recognition of the capacity of *Minecraft*’s landscape to provoke reflection on the environment-as-environment. Discussing a similar example—a mock ‘nature documentary’ using underwater footage from *Grand Theft Auto V*—P. Saxton Brown observes that “natural environments in games are not always beholden to the goal-directed behavior of the user, and can lead to the user’s more complex considerations of ecosystems and the non-human” (384). In a moment of narrative *mise en abyme*, *Towards Dawn* ends with the only extra-diagetic comment by the player-narrator: “I looked back west and thought about all the crazy experiences I had had. I’m not just saying this, mind you. I am not talking about some fictional nomad. I had these thoughts while I was sitting behind my computer, moving my mouse to follow the path of the sun. It was one of the strangest, gut-wrenching, bittersweet moments I have ever experienced in a videogame, to know this adventure was coming to an end.” This shift draws the experiences of the game-world out into the environment of the non-game world, collapsing the gap between real experience and virtual environment.

## Conclusion

Computer games offer the opportunity to enable and facilitate interactions with (virtual) environments that provoke non-trivial ecological consideration and critique. But too many games re-inscribe ideological and cultural norms that are ecologically regressive. This may be through representations of natural environments that are mere backdrops to the more substantial elements of anthropocentric action; or, through procedural mechanics that cast the environment as the location of resources to be utilised by the human player.

Other games take environmental issues as their explicit focus. Although games such as *Fate of the World* may raise the profile of problems such as climate change with players who might not engage with them otherwise, here too uninterrogated assumptions and norms may have unintended consequences. I have argued in this essay that games which offer the player a toolkit of top-down policy interventions as solutions to problems like climate change, and in which individuals are, broadly, invisible may in fact be disempowering, underplaying the potential for change on the level of individual behaviour. Furthermore, there is a concern that, in their implicit belief in global technocratic and interventionist approaches to the problem of climate change, 'god games' draw on a philosophical tradition that asserts man's control over nature, and so are aligned with potentially dangerous geo-engineering interventions.

However, despite these criticisms, there are clear examples of game-environments, game-mechanics, and game-play that address each of these limitations. Participatory alternate-reality games like *World Without Oil* create plural and dynamic engagements with complex large-scale environmental issues on the local and personal level, which offer an alternative to the technocratic approach, empowering individuals and their imaginative responses to environmental problems. In contrast to the open-ended invitation for player responses of *WWO*, games like *Minecraft* are relatively constrained, at least in the sense that player actions are limited. However, while the procedural mechanics of the game might be limiting, the in-game world is large enough to allow for new modes of engaging with the game-worlds' landscape and ecology. Via examples of 'expansive play', *Minecraft* can shift from being a game whose narrative is powered by resource extraction and utilization, to one which is a critique of this, or one where other environmental interactions become possible. These alternative strategies are achieved through a reinterpretation by the player of the procedural rhetoric of the game, resisting elements of its apparent procedurality. Here, game-playing strategies show the capacity that games have for ecological critique and engagement: players renegotiate their relationship with the game-environment.

What the ecocritical readings presented here reveal are interlinked developments of wider relevance to environmental games. On the one hand, increases in the processing power of game platforms, allowing improvements in games' graphics and the possibility of rendering game worlds of massive size and interactivity, have played an important part in enabling games which can encourage or allow players to engage with them ecocritically. Sandbox games like *Minecraft* or the *GTA* series may not



invite narratives or player actions that include environmental engagement, but their expansive game worlds offer players the opportunity to create their own critiques or commentaries outside the expected 'standard' or mainstream player interactions with the game environment. On the other hand, we might note, in parallel, the increasing confidence and maturity of computer games as a cultural form – from both designers and players – in addressing 'serious' subjects in game play, including ecological issues. Ecocritical scholarship in Games Studies is important in developing this.

The ecological engagements examined here come either from relatively niche games – such as *World Without Oil*, *Fate of the World*, or *Mountain* – or from unusual modes of game play in mainstream games titles such as *Minecraft*. Examples of games encompassing ecological thinking are still relatively unusual, and forms of ecological 'expansive play' are exceptions, rather than the norm. However, given the trends noted above, it is reasonable to expect both to become more common in the coming years, and for ecological engagement to become increasingly embedded in game design and play.

## Works Cited

- Allwood, Julian et al. "Integrated Land-Water-Energy Assessment Using the Foreseer Tool." Vol. 18. N.p., 2016. 17130. *NASA ADS*. Web. 2 Feb. 2017.
- Arnott, Jack. "Fate of the World – Review." *The Guardian* 31 Oct. 2010. *The Guardian*. Web. 2 Feb. 2017.
- Bajzelj, Bojana et al. "Teaching Sustainable and Integrated Resource Management Using an Interactive Nexus Model." *International Journal of Sustainability in Higher Education* 17.1 (2015): 2–15. *emeraldinsight.com (Atypon)*. Web.
- Bianchi, Melissa. "Rhetoric and Recapture: Theorising Digital Game Ecologies through EA's *The Sims* Series." *Green Letters* 18.3 (2014): 209–220. Print.
- Bogost, Ian. "The Rhetoric of Video Games." *The Ecology of Games: Connecting Youth, Games, and Learning*. Ed. Katie Salen. Cambridge, MA: The MIT Press, 2008. 117–140. Print.
- . *Persuasive Games*. The MIT Press, 2010. Print.
- . "You Are Mountain." *The Atlantic*. N.p., 17 July 2014. Web. 5 Dec. 2014.
- Brown, P. Saxton. "The Garden in the Machine: Video Games and Environmental Consciousness." *Philological Quarterly* 93.3 (2014): 383–407. Print.
- Chang, Alenda. "Games as Environmental Texts." *Qui Parle: Critical Humanities and Social Sciences* 19.2 (2011): 57–84. Print.
- . "Playing Nature: The Virtual Ecology of Game Environments." PhD thesis. 2013. Web. 4 Jan. 2017.
- Civilization*. Microprose. 1991. Video game.
- Colonization*. Microprose. 1994. Video game.
- "DECC Presents: My2050." Web. 2 Feb. 2017. <http://my2050.decc.gov.uk/>

Dudman, Jane et al. "My 2050 World: How Would You Cut Carbon While Meeting Energy Demand?" *The Guardian* 18 Sept. 2014. *The Guardian*. Web. 3 Feb. 2017.

Edwards, Paul N. *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge, Mass: MIT Press, 2010. Print.

"Far Lands or Bust!" *YouTube*. N.p., n.d. Web. 2 Feb. 2017.

*Fate of the World*. Red Redemption. 2011. Video game.

"Foreseer." Web. 2 Feb. 2017. <http://www.lcmp.eng.cam.ac.uk/foreseer>

Forrester, Jay W. *World Dynamics*. Wright-Allen Press, 1971. Print.

Kushner, David. "Life Is a Game." 1 April 2005. *MIT Technology Review*. Web. 2 Feb. 2017.

Levin, Kelly et al. "Overcoming the Tragedy of Super Wicked Problems: Constraining Our Future Selves to Ameliorate Global Climate Change." *Policy Sciences* 45.2 (2012): 123–152. [link.springer.com](http://link.springer.com). Web.

McCarthy, Michael. "How I Tried to Save the World – from the Comfort of My Desk." *The Independent* 28 July 2010. Web. 1 Feb. 2017.

McGonigal, Jane. *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*. London: Vintage, 2012. Print.

MacKay, David. "2050 Calculator Tool at DECC." 29 July 2010. Web. 2 Feb. 2017. <http://withouthotair.blogspot.com/2010/07/2050-calculator-tool-at-decc.html>

Meadows, Donella H. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. Second edition. New York: Universe Books, 1972. Print.

*Minecraft*. Mojang. 2009. Video game.

"Minecraft Far Lands or Bust - An Expedition in Search of Adventure, Exploration and Now, for Charity!" N.p., n.d. <http://farlandsorbust.com/index.php> Web. 2 Feb. 2017.

"Minecraft: Pixel's Vegetarian Challenge! Minecraft Blog." N.p., n.d. Web. 2 Feb. 2017. <http://www.planetminecraft.com/blog/minecraft-pixels-vegetarian-challenge/>

*Mountain*. David O'Reilly. 2014. Video game.

Nye, David E. *America as Second Creation: Technology and Narratives of New Beginnings*. MIT Press, 2004. Print.

Oelschlaeger, Max. *The Idea of Wilderness: From Prehistory to the Age of Ecology*. Yale University Press, 1991. Print.

O'Connor, Alice. "RPS Blather About: Mountain." *Rock, Paper, Shotgun*. N.p., 1 July. 2014. Web. 12 July 2017.

O'Neill, Saffron, and Sophie Nicholson-Cole. "'Fear Won't Do It': Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations." *Science Communication* 30.3 (2009): 355–379. *SAGE Journals*. Web.

Parham, John. *Green Media and Popular Culture: An Introduction*. Basingstoke: Palgrave Macmillan, 2015. E-book.

Parkin, Simon. "A Journey to the End of the World (of Minecraft)." *The New Yorker* 23 Jan. 2014. Web. 2 Feb. 2017.

Rust, Stephen, Salma Monani, and Sean Cubitt. *Ecomedia: Key Issues*. London: Routledge, 2015. Print.

Sheely, Kent. *Resourcefull*. N.p., 2014. Web. 31 Oct. 2014.

"SimCity™ 4 Deluxe Edition (TRAILER 2)." *YouTube*. Web. 31 Jan. 2017.

*SimCity*. Maxis. 1989. Video game.

*SimCity 4*. Electronic Arts. 2003. Video game.

Smith, Quintin. "Wot I Think: Fate Of The World." *Rock, Paper, Shotgun*. N.p., 11 Mar. 2011. Web. 2 Feb. 2017.

"The Games of Christmas '11: Day 11." *Rock, Paper, Shotgun*. N.p., 11 Dec. 2011. Web. 6 Feb. 2017.

Thoreau, Henry David. *Henry David Thoreau : Collected Essays and Poems*. Ed. Elizabeth Hall Witherell. New York: Library of America, 2001. Print.

Vaughan, Adam. "Go for Nuclear or Ramp up Solar with DECC's Carbon Calculator." *The Guardian* 27 July 2010. *The Guardian*. Web. 1 Feb. 2017.

*World Without Oil*. Electric Shadows. 2007. Video game.